DOCUMENT RESUME

ED 118 125 IR 003 030

AUTHOR Powers, Donald E.
TITLE Dual Audio Television: An Evaluation of a Six-Month Public Broadcast.
INSTITUTION Educational Testing Service, Princeton, N.J.; Philadelphia School District, Pa. Office of Curriculum and Instruction.
REPORT NO ETS-PR-75-21
PUB DATE Oct 75
NOTE 68p.; For related documents see ED 094 753 and IR 003 027-029

EDRS PRICE MF-$0.83 HC-$3.50 Plus Postage
DESCRIPTORS Audiovisual Instruction; *Commercial Television; *Educational Radio; Educational Research; Elementary Education; *Experimental Programs; Instructional Innovation; Instructional Technology; Programing (Broadcast); Research Methodology; Statistical Analysis; Statistical Data; Television; *Television Research; Television Viewing; *Vocabulary; Vocabulary Development
IDENTIFIERS *Dual Audio Television; Flintstones; Philadelphia City Schools

ABSTRACT

The Philadelphia City Schools engaged in a four-year program to develop and test dual audio television, a way to help children learn more from the massive amount of time they spend watching commercial television. The format consisted of an instructional radio broadcast that accompanied popular television shows and attempted to clarify and amplify the vocabulary and word concepts that were introduced. Using such a format for the "Flintstones" program, a study attempted to find the degree to which students could be encouraged to listen to the radio supplement, and the degree to which the special broadcast increased vocabulary learning. Results showed that differences in encouragement made only very slight differences in the rate of listening and that listening did not account for a significant portion of the variation in students' vocabulary improvement. (EMH)

****
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
****

ED118125

DUAL AUDIO TELEVISION: AN EVALUATION OF A SIX-MONTH PUBLIC BROADCAST

Donald E. Powers
Project Director

Submitted to the Dual Audio TV Project, Office of Curriculum and Instruction of the Philadelphia Board of Education

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

October, 1975

IR000330

TABLE OF CONTENTS

	Page
INTRODUCTION	1
Background	1
The Dual Audio Treatment	3
DESIGN OF THE STUDY	4
General Considerations	4
Encouragement	4
Viewing and Listening	6
Sample Selection	7
Measuring Instruments	9
Vocabulary Tests	9
Viewing/Listening Measures	10
ANALYSES AND RESULTS	12
Utilization of Dual Audio Instruction	12
The Effect of Encouragement	16
Classification Scheme	22
Total Test Score Results Based on Viewing/Listening Groups	26
Components of Variance	32
Total Test Score Results Based on Number of Times Students were Reported Viewing and Listening	33
Relationships Among Viewing and Listening Measures	41
Analyses Based on Viewing/Listening Test Scores	43
Students Reported Listening During the Fifth Monitoring Period	43
Item Analyses	43
SUMMARY, CONCLUSIONS, AND SUGGESTIONS FOR FURTHER RESEARCH	48
Summary and Conclusions	48
Limitations of the Study	50
Suggestions for Future Research	54
References	57
Appendix A Telephone Monitoring Form	
Appendix B Pictorial Viewing Measure	
Appendix C Dual Audio TV Listening Test	

LIST OF TABLES

Number	Title	Page
Table 1	Proposed Classification of Viewers/Listeners	7
Table 2	Number and Location of Participating Classes	8
Table 3	Reliability Estimates for Pretest and Posttest Scores	10
Table 4	Number of Telephone Monitorings Completed during each Monitoring Period for Students who had Pretest and Posttest Scores	12
Table 5	Number Students for whom Various Numbers of Completed Telephone Monitorings were Obtained	13
Table 6	Viewing/Listening Status of all Monitored Students by Monitoring Period	14
Table 7	Number and Percent of Total Student Sample Reported Viewing and Listening Various Numbers of Times	17
Table 8	Number and Percent of Students Monitored Five Times who Viewed and Listened Various Numbers of Times	18
Table 9	Statistical Sign Test on Class Means (Encouraged vs. Minimally Encouraged)	19
Table 10	Mean Pretest, Gain, Viewing, and Listening Scores for Encouraged and Minimally Encouraged Groups (Total Students with Two or More Monitorings)	20
Table 11	Percentage of Residual Posttest Variance (Pretest Partialled Out) Accounted for by Encouragement in each Sample	21
Table 12	Number and Percentage of Students Reported Listening Various Percentages of Times Monitored	21
Table 13	Viewing (Listening) Scoring Scheme	23
Table 14	Classification of Students According to Viewing/Listening Habits	24

LIST OF TABLES (CONT.)

Number		Page
Table 15	Percentage of all Students who Reported on the Television Viewing Record that they Usually Viewed The Flintstones at 4:30	25
Table 16	Mean Pretest and Raw Gain Scores by Viewing/Listening Classification (Total Students Monitored Two or More Times)	26
Table 17	Mean Pretest and Raw Gain Scores by Viewing/Listening Classification (First Grade)	27
Table 18	Mean Pretest and Raw Gain Scores by Viewing/Listening Classification (Second Grade NonTitle I)	28
Table 19	Mean Pretest and Raw Gain Scores by Viewing/Listening Classification (Second Grade Title I)	28
Table 20	Mean Pretest and Raw Gain Scores by Viewing/Listening Classification (Third Grade)	29
Table 21	Adjusted Posttest Means by Viewing/ Listening Classification (First Grade)	30
Table 22	Adjusted Posttest Means by Viewing/ Listening Classification (Second Grade NonTitle I)	30
Table 23	Adjusted Posttest Means by Viewing/ Listening Classification (Second Grade Title I)	31
Table 24	Adjusted Posttest Means by Viewing/ Listening Classification (Third Grade)	31
Table 25	Percentage of Variance Accounted for by Pretest, Viewing, and Listening for each Grade Level Sample	32
Table 26	Pretest and Gain Scores by Number of Times Viewing and Listening for Total Sample (Standard Deviations in Parentheses)	36

LIST OF TABLES (CONT.)

Number	Title	Page
Table 27	Pretest and Gain Scores by Number of Times Viewing and Listening for First Grade Sample (Standard Deviations in Parentheses	37
Table 28	Pretest and Gain Scores by Number of Times Viewing and Listening for Second Grade NonTitle I Sample (Standard Deviations in Parentheses)	38
Table 29	Pretest and Gain Scores by Number of Times Viewing and Listening for Second Grade Title I Sample (Standard Deviations in Parentheses)	39
Table 30	Pretest and Gain Scores by Number of Times Viewing and Listening for Third Grade Sample (Standard Deviations in Parentheses)	40
Table 31	Pretest and Gain Scores by Number of Times Reported Listening (Total Sample)	41
Table 32	Percentage of Variance Accounted for by Pretest, Total Viewing, and Total Listening for each Grade Level Sample	41
Table 33	Correlations among Viewing and Listening Measures (Total Sample)	42
Table 34	Percentage of Selected Students Correctly Answering ch Item on Pretest and Gain in Percentage from Pretest to Posttest (Form A)	44
Table 35	Percentage of Selected Students Correctly Answering ach Item on Pretest and Gain in Percentage from Pretest to Posttest (Form B)	45
Table 36	Percentage of Students Correctly Answering ch Item on Pretest and Gain in Percentage from Pretest to Posttest (Form C)	46

Acknowledgments

The evaluation study that is reported herein was a joint effort conducted by Educational Testing Service and the Dual Audio Television Project staff of the Philadelphia Board of Education. Dual Audio TV Project staff assumed responsibility for all production and operational tasks associated with the Dual Audio broadcast. In addition various Dual Audio staff members played major roles in the solicitation of project participants, in the collection and organization of data, and in making valuable suggestions concerning the design and conduct of the study. Dual Audio staff members who deserve special mention for their contributions are Terry Borton, Director of the Dual Audio Television Project, and, in alphabetical order, Steve Baskerville, Len Belasco, Lynn Gotts, and Rae Williams, all of whom made unique contributions to the study.

ETS staffers included Judy Pollack-Ohls, who supervised data processing and computer programming activities, Sam Ball, who made suggestions regarding the project design and the final report, Elsa Rosenthal, who edited the final report, and Lucy Harvey, who assumed various administrative and secretarial duties including typing this report.

INTRODUCTION

Background

In recent years educators have become increasingly aware of the actual and potential impact of television. This awareness has resulted in large part from the demonstrated success of shows like Sesame Street and The Electric Company. (Ball and Bogatz, 1970; Ball and Bogatz, 1973)

However, while Sesame Street and The Electric Company have helped to encourage other ventures into educational programming, much, if not most, of a child's television viewing time is still spent on shows that are, primarily, entertaining--not educational. Furthermore, a typical child spends a significant portion of his waking hours watching television. Lyle and Hoffman (1972), for example, estimate that the American child watches TV an average of twenty to thirty hours a week--more time than he spends in school. It is known that the vast majority of these hours are spent watching entertainment programs.

The originators of dual audio television have recognized the extent to which children view entertainment television, but they have contended that many entertainment TV programs have "genuine educational potential for children, since they contain new vocabulary, ways of solving problems, etc." (Borton, Belasco, and Baskerville, 1974). With this in mind, dual audio television has been developed as a method of increasing the educational benefit from the commercial TV entertainment shows that children already devotedly watch. As its name suggests, dual audio instruction provides audio commentary to supplement the commentary of the entertainment television program. Children watch television as they normally would, but over an FM radio they can simultaneously hear the dual audio instructor commenting about particular aspects of the TV program

they are watching. Although the supplementary instruction occurs simultaneously with the TV show, the dual audio instructor does not interrupt the television characters but comments during pauses in the dialogue.

The writers of dual audio commentary first obtain the show from the TV station, preview it on a video tape recorder, and then write the supplemental script to be used by the instructor. When he explains words, tells jokes, or comments about the action, the dual audio instructor gives the impression that he is watching the show with the kids.

Over the last four years, the dual audio television staff under the Philadelphia Board of Education's Office of Curriculum and Instruction has conducted a variety of laboratory studies, field tryouts, and one two-week public broadcast. The results of these research studies have been positive enough to encourage dual audio staff to conduct a six-month public broadcast using the animated cartoon show, The Flintstones. The evaluation of the impact of that broadcast is the subject of this report.

The evaluation differed in several important respects from previous research studies conducted by the dual audio staff. First, the dual audio instruction itself was different from that of previous studies in several ways. The broadcast period was six months and, therefore, considerably longer than any previous ones. Second, a different television show was used. Whereas previous dual audio instruction had been based on the shows Astro Boy and Gilligan's Island, the present tryout used a cartoon series: The Flintstones.

The evaluation discussed in this report also differed in several respects. In contrast to previous studies, the present evaluation was characterized by

(1) much larger student samples, (2) the use of a pretest to control for initial differences among these samples, and (3) random assignment of students to experimental conditions. A fuller description of the evaluation design is presented below.

The Dual Audio Treatment

In the present study dual audio instruction consisted of six months of daily (Monday-Friday) half-hour episodes of The Flintstones, broadcast at 4:30 p.m. over a Philadelphia UHF channel. Dual audio commentary was aired on a local FM radio station during the same half-hour period for six months. Although the dual audio staff have explored the use of dual audio instruction in a number of areas (e.g., problem solving, interpersonal processes, and vocabulary development), the public broadcast of The Flintstones was limited to teaching vocabulary. Each of the one hundred and twenty dual audio scripts (one for each Flintstones episode) contained instruction--both explicit and implicit definitions--for two words heard in a particular episode. There was little attempt in subsequent episodes to review or reinforce the words taught previously, since they often did not reappear. Those words which were taught and also tested appear in Tables 34-36. No formal analysis was undertaken to determine the grade level of these words for receptive vocabulary. Item data which is presented later in this report, however, suggests considerable variation with respect to the difficulty level of the words.

DESIGN OF THE STUDY

General Considerations

The design used in the present research was basically a three-factor pretest/posttest design in which the factors considered were

(1) encouragement

(2) viewing

and (3) listening.

Encouragement was a two-level factor consisting of an encouraged and a minimally-encouraged condition. Classes of students were paired, and one member of each pair was randomly assigned to one of the two levels of encouragement. Both the viewing factor and the listening factor had three levels--low, middle, and high. The level at which a particular student was placed was determined by the various viewing and listening measures administered during the six-month broadcast period. The viewing and listening factors are correlated by virtue of the nature of dual audio instruction, since students who do not view do not listen either. As the term has been used here, viewing means watching the TV show, The Flintstones. Listening means listening to dual audio commentary on the FM radio station over which it was broadcast.

Encouragement

As stated above, encouragement was a true experimental condition. Thirty-one pairs of classes were formed on the basis of information about each class's general level of ability. Insofar as possible a class was paired with a comparable one in the same school. For example, a homogenously grouped class of high-ability second graders was paired with a similarly grouped class in

the school. In some cases, however, it was necessary to designate less suitable pairs by coupling classes from different schools or classes of slightly different ability levels. After suitable pairings were established (nine classes were excluded from the study because suitable pairings could not be designated), classes in each pair were randomly assigned to levels of the encouragement factor. Encouraged classes were visited by dual audio staff in an attempt to encourage the children to regularly listen to dual audio instruction. A letter was also sent to the home of each student in heavily encouraged classes to inform parents about dual audio instruction. The encouragement was intended primarily for those students who were already Flintstones viewers. No attempt was made to persuade nonviewing students to begin watching The Flintstones, since the philosophy of the dual audio technique is to take advantage of the entertainment TV that children already watch. Encouraged students were also shown how to tune in dual audio instruction on their FM radios. Children in minally encouraged classes received only information on the availability of dual audio instruction. All children in the study (and in the city of Philadelphia) had access to the promotional messages that were aired on WKBS (the Philadelphia station carrying The Flintstones) during the first week of dual audio broadcasts and during the prior week. The decision to use an encouraged/minimally encouraged manipulation instead of an encouraged/not encouraged one was based on information from previous dual audio tryouts which suggested that the percentage of students who could be expected to regularly use dual audio instruction would probably be less than 10% This low expectancy was the result of the number of conditions that had to be satisfied before a child could be considered

to be a regular user of dual audio instruction. That is if only 25% of all students were regular Flintstones viewers, and if only 25% of these could be expected to listen to dual audio commentary on a regular basis, then only about 6% of all students could be considered as regular users of dual audio instruction. Given this expectancy, it seemed wise to encourage all students to some degree in order to boost dual audio usage.

Although the encouragement condition used in this study was a true experimental manipulation, it was only indirectly related to the variable of major interest--improvement in vocabulary knowledge. The voluntary, at-home nature of participation also meant that many of the encouraged children might fail to use dual audio instruction, whereas some of the minimally encouraged children might become regular dual audio listeners. Thus, encouragement in the present study was thought of as a second-order treatment, since its effect on the criterion was indirect, i.e., through its effect on the viewing/listening habits of students. Furthermore, since encouragement could be expected to have a less-than-perfect relationship to dual audio use, it would probably have an even more tenuous relationship to the criterion. A more direct indication of dual audio use was, therefore, included in the study design in the form of a viewing factor and a listening factor.

Viewing and Listening

A viewing factor and a listening factor were included in the design in order to group students according to the extent to which they used dual audio instruction. A bivariate classification scheme based on viewing and listening which was proposed is presented in Table 1. The methods used to classify students according to viewing/listening habits are discussed below in the section on measuring instruments.

Table 1

Proposed Classification of Viewers/Listeners

Listens \ Views	Never or Infrequently	Occasionally	Frequently
Frequently	——	——	Regular dual audio users
Occasionally	——	Occasional dual-audio users	Regular viewers, occasional dual audio users
Never or Infrequently	Non users	Occasional viewers only	Regular viewers only

Sample Selection

In accordance with the study design, the administrative heads of two Philadelphia school districts were contacted in order to determine their interest in and willingness to cooperate in the dual audio study. Principals in each of the districts' schools were then contacted and the dual audio project explained in order to determine their interest in the study. When a principal expressed willingness to participate in the study, a presentation was made to teachers in the principal's school that explained the purpose of the study and the demands it would place on teachers. Some schools declined to participate in the study, but none of the teachers in the participating schools refused.

The two districts were selected because of certain district characteristics which were thought might facilitate the implementation of the study (e.g., proximity to dual audio headquarters) and also because of certain student characteristics. One of the districts contained a high proportion of Title I schools, while the other contained a very low proportion. All the schools selected

for the study from the first district were Title I schools, whereas none of the participating schools from the second district were. First and second grade classes from non-Title I schools and second and third grade classes from Title I schools were selected to participate in the study. The primary target group was second grade students. The particular sampling configuration chosen was thought to maximize measurement capabilities. A summary of participation by grade level and Title I status is given in Table 2. Usable pretest scores

Table 2

Number and Location of Participating Classes

Grade Level	Title I	Non-Title I	Total
1	—	11	11
2	22	11	33
3	20	—	20
Total	42	22	64

were obtained for 1,711 students in these classes; 1,524 students in these classes also had usable posttest scores.

Available district-wide achievement test data suggested that the two districts which were selected were representative of districts containing predominantly Title I schools and those with few Title I schools, respectively.

Measuring Instruments

Vocabulary Tests

Several instruments were developed as measures of the evaluation study's criterion of interest--vocabulary development. Prior to the development of dual audio scripts for the six-month broadcast, dual audio staff compiled for the evaluator lists of vocabulary words appearing in the scripts of The Flintstones episodes that would be broadcast during the six-month period. The words which had the highest probabilities of also being included in dual audio scripts, i.e., taught via dual audio radio, were designated by dual audio staff. A vocabulary item was then developed for each of the words specified by dual audio staff. The items were pretested and revised using small samples of students in schools comparable to those participating in the study.

In order to obtain information on a relatively large number of words in the relatively short time that was available for testing, three parallel twenty-item test forms were assembled. Triplets of items were formed so that each triplet contained words that would be broadcast during the same month and that had the same relative difficulty, as determined by pretest data. Each item in twenty triplets was randomly assigned to one of three test forms, which were used as both pretests and posttests. In subsequent analyses involving total test scores, the three forms were treated as equivalent, although there was no formal attempt to equate them statistically. Table 3 shows that each of the twenty item-forms was sufficiently reliable for comparisons of group differences. Vocabulary tests were group-administered to each class, and the test administrator read each test item aloud in order to minimize variance due to reading ability.

Table 3

Reliability Estimates* for Pretest and Posttest Scores

Test Form	Pretest	Posttest
A	.74	.82
B	.72	.80
C	.76	.80

*Cronbach's coefficient alpha

Viewing/Listening Measures

Several measurement techniques were used to determine student use of dual audio instruction. The primary method was a telephone monitoring system. Monthly calls were placed to the home of each participating student (for whom a telephone number was available) during the half-hour dual audio broadcast period. A sequence of from two to six questions was asked in order to determine whether the child had been viewing and/or listening on that day. If the respondent indicated that the child had neither viewed nor listened, alternative sequences of questions were asked about the child's usual viewing and listening habits. Telephone monitors were given detailed instructions about placing calls, asking questions, and recording responses. The telephone monitoring form used in the study appears in Appendix A.

During both the pretest and posttest sessions students were also administered a pictorial viewing measure. The measure consisted of a series of pictures

representing the television shows that were broadcast by other stations at the same time as WKBS's broadcast of The Flintstones. Students were instructed to choose the TV show that they usually watched during The Flintstones time period,* if they usually watched TV at that time of day. This viewing measure is attached as Appendix B.

Finally, a viewing/listening test was devised as an additional check on students' viewing/listening habits. Five-item forms were developed for several episodes of The Flintstones. Each form contained three questions related to a specific episode, i.e., half-hour segment, of The Flintstones. The remaining two questions pertained to the dual audio commentary for that episode. The questions were intended to be easy ones that dealt with "memorable" incidents. The intention was to develop a measure on which nearly all the students who watched and/or listened could answer all of the questions, but on which students who did not view/listen could answer none. Each test was administered on the day following the particular episode to which the test pertained. Unfortunately, at most only two such tests could be administered to each student without intruding too much on regular classroom activities. An example of one viewing/listening test has been included as Appendix C.

---

*The Flintstones was broadcast in Philadelphia at 4:30 p.m. and again at 5:00 p.m. Although dual audio instruction occurred during only the first half-hour segment, the viewing measure contained a question for each segment.

ANALYSES AND RESULTS

Many of the analyses that were conducted for this study were a priori in nature. However, additional post hoc analyses were also done in order to use the available data to the fullest. The distinction between those analyses that were planned before data analysis was initiated and those that suggested themselves as data were being analyzed will be maintained throughout this section.

Utilization of Dual Audio Instruction

The primary means for determining student utilization of dual audio instruction was the telephone monitoring system mentioned above. Monthly calls were placed to the home of each participating child during the half-hour broadcast period. Table 4 shows the number and percentage of completed telephone monitorings for each of the five monitoring periods.

Table 4

Number of Telephone Monitorings Completed during each Monitoring Period for Students who had Pretest and Posttest Scores

Period	Number Completed	Percent Completed
One	801	52.5
Two	718	47.1
Three	700	45.9
Four	648	42.5
Five	652	42.8

As can be seen, during the most successful monitoring period only slightly more than half (52.5%) of the student sample could be successfully monitored. During the last two periods this number dropped to about 43%. This drop is due in large measure to students' names being deleted from calling lists for any of a number of reasons such as parents expressing a desire to be called no further and numbers being changed or becoming unlisted.

There were also differences among students with respect to the numbers of times they were successfully monitored. Table 5 shows that about 16% of the students in the sample were monitored on all five occasions. At the other extreme, nearly a third (32.2%) of the sample could not be monitored even one time. The relatively large number of students to

Table 5

Number Students for whom Various Numbers of Completed Telephone Monitorings were Obtained

Number of Completed Monitorings	Number of Students	Percent
None	491	32.2
One	114	7.5
Two	155	10.2
Three	218	14.3
Four	299	19.6
Five	247	16.2
Total	1524	100.0

whose homes no successful calls were made can be attributed mainly to the large number of unlisted or unpublished numbers, incorrect listings, or the absence of a phone in the home.

Table 6, which summarizes the information obtained from the telephone monitoring system, shows that during three of the five periods (those conducted during the winter months) over half of the children in the sample were reported to be watching television when called. A slight drop (to about 45%)

Table 6

Viewing/Listening Status of all Monitored Students by Monitoring Period

Viewing/Listening Status \ Monitoring Period	One		Two		Three		Four		Five	
	N	%	N	%	N	%	N	%	N	%
TV Viewing										
Viewing When Called	451	53.1	444	58.5	427	58.0	319	46.3	302	43.9
Usually Views at that Time	299	35.2	241	31.8	238	32.3	286	41.5	293	42.6
Not Viewing, Doesn't Usually	93	11.0	69	9.1	71	9.6	82	11.9	91	13.2
Flintstone Viewing										
Viewing Flintstones When Called	284	33.5	256	33.7	260	35.3	211	30.6	181	26.3
Not Viewing, but Usually Views Flintstones	202	23.8	184	24.2	169	23.0	239	34.7	241	35.0
Dual-Audio Listening										
Listening When Called	111	13.1	120	15.8	108	14.7	87	12.6	75	10.9
Not Listening, but Usually Listens	43	5.1	61	8.0	61	8.3	45	6.5	41	6.0
Total Monitored	849	100.0	759	100.0	736	100.0	689	100.0	688	100.0

in television viewing was noted for the last two monitoring periods, monitorings conducted during the spring months. On the average, nearly a third of those called during each period were reported to be watching The Flintstones when called. Again a decline (to 26.3%) was noted for the last monitoring period.

In addition to the sizable numbers reported to be viewing when called, substantial numbers of usual viewers were also so reported. The percentage of usual Flintstones viewers ranged from 23% to 35% across the five monitorings. Needless to say, then, it appears from the telephone monitoring data that television watching in general and Flintstones viewing in particular were popular activities with the audiences in the study.

The percentage of children who were listening to dual audio radio when called was approximately 11% to 16%--close to initial expectations. Another 19% of those called (on the average) reported that the subject child was not listening to dual audio radio, but that he/she usually did. Like TV viewing, the rate of dual audio listening was also subject to seasonal weather changes. The highest listening rate (15.8%) was recorded during the second monitoring period, whereas the lowest (10.9%), which represents a drop of about 30% from the highest period, was recorded during the last (April-May) monitoring period. For each of the monitoring periods, the rate of dual audio listening remained proportional to the rate of Flinstones viewing. That is, about 40% of those reported viewing The Flintstones on each occasion were also reported to be listening to dual audio radio. From these data, therefore, it seems that dual audio radio retained about the same degree of popularity during each of the five monitoring periods.

Table 7 presents raw data on the total number of times that all monitored students were reported listening and viewing, regardless of the number of times they were monitored (all were monitored at least once). Thus about 57% of the students were reported to be viewing and 29% to be listening during at least one of the five monitoring periods.

As one would expect, these figures change somewhat when only those monitored all five times are considered. Table 8 shows the percentage in each cell for those monitored every time. Since the number of monitorings is greater for these students, they have, automatically, a correspondingly greater chance of being reported as viewing and/or listening a greater number of times than do those monitored fewer than five times. Estimates from this subsample suggest that about 70% of the sample were viewing The Flintstones at least once when called and that 39% were listening to dual audio at least once.

The Effect of Encouragement

Since the class was the experimental unit towards which encouragement was directed, the class was also used initially as the unit of analysis. A statistical sign test showed that there were no significant differences among any of the variables, except listening, when class means were used in the analysis (Table 9).

Computing the mean (of class means) for each variable revealed that the differences between the encouraged and the minimally encouraged classes were small with respect to each variable—even listening.

Table 7

Number and Percentage of Total Student Sample Reported Viewing and Listening Various Numbers of Times

Times Reported Viewing / Times Reported Listening	None		One		Two		Three		Four		Five		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Five	—		—		—		—		—		4	0.4	4	0.4
Four	—		—		—		—		8	0.8	5	0.5	13	1.3
Three	—		—		—		10	1.0	9	0.9	1	0.1	20	2.0
Two	—		—		43	4.2	23	2.3	8	0.8	4	0.4	78	7.7
One	—		84	8.3	64	6.3	19	1.9	10	1.0	1	0.1	178	17.5
None	436	42.9	169	16.7	80	7.9	27	2.7	10	1.0	—		722	71.1
Total	436	42.9	253	24.9	187	18.4	79	7.8	45	4.4	15	1.5	1015	100.0

Table 8

Number and Percentage of Students Monitored Five Times who Viewed and Listened Various Numbers of Times

Times Reported Viewing / Times Reported Listening	None N	None %	One N	One %	Two N	Two %	Three N	Three %	Four N	Four %	Five N	Five %	Total N	Total %
Five	—		—		—		—		—		4	1.7	4	1.7
Four	—		—		—		—		4	1.7	5	2.1	9	3.8
Three	—		—		—		3	1.3	7	2.9	1	0.4	11	4.6
Two	—		—		8	3.4	8	3.4	3	1.3	4	1.7	23	18.9
One	—		15	6.3	17	7.1	7	2.9	5	2.1	1	0.4	45	18.9
None	72	30.3	38	16.0	17	7.1	14	5.9	5	2.1	0	0.0	146	61.3
Total	72	30.3	53	22.3	42	17.6	32	13.4	24	10.1	15	6.3	238	100.0

Table 9

Statistical Sign Test on Class Means
(Encouraged vs. Minimally Encouraged)

Measure \ Group	Encouraged N=31	Minimally Encouraged N=31	Significance
Pretest	15*	16	N.S.
Posttest	17	14	N.S.
Gain	16	15	N.S.
Viewing	16	15	N.S.
Listening	21	9	p = .05

*Table entries are the number of times in each of 31 class pairs that the mean of the class in the designated encouragement level was higher than the mean of the class which was paired with it and assigned to the other level of encouragement.

The difference between the mean listening score for the encouraged and the minimally encouraged classes was only .2 and not significant, when a one-tailed t test was used.

At the request of dual audio staff, a post hoc analysis using the individual as the unit of analysis was also conducted. Table 10 shows about the same results as the classroom means analysis except that the small difference between the listening scores of the two groups is statistically significant (as any difference will be if the size of the sample becomes large enough).

Regression analyses were also computed for each of the four student samples to determine the effect of encouragement on posttest scores. Since encouragement appeared to have little effect on listening, it is not surprising that in none

Table 10

Mean Pretest, Gain, Viewing, and Listening Scores for Encouraged and Minimally Encouraged Groups (Total Students with Two or More Monitorings)

Measure \ Group	Encouraged (N = 412)		Minimally Encouraged (N = 465)		Difference	Significance of Difference
	Mean	S.D.	Mean	S.D.		
Pretest	9.7	(3.8)	9.8	(3.8)	-0.1	N.S.
Gain	1.8	(3.0)	1.9	(3.1)	-0.1	N.S.
Viewing	1.3	(1.0)	1.2	(0.9)	0.1	N.S.
Listening	0.7	(0.8)	0.5	(0.7)	0.2	$p < .01$

of the four samples did encouragement account for a significant--either practical or statistical--portion of residual posttest variance (pretest partialled out). The largest portion in any sample was only slightly more than 1%. Percentages are given in Table 11. The finding that encouragement was not related to posttest scores was expected, since, as noted above, encouragement seemed to have little practical effect on children's listening habits. Just how little the difference in the encouragement conditions seemed to influence students is shown in Table 12, which gives the number and percentage of children who were reported to be listening during various percentages of monitorings.

Although the encouragement effect was in the appropriate direction, it was not large. For instance, the percentage of the encouraged group who were reported to be listening more than half the times they were monitored, was slightly greater than the corresponding percentage for minimally

Table 11

Percentage of Residual Posttest Variance (Pretest Partialled Out) Accounted for by Encouragement in Each Sample

Sample	Percent of Variance	Significance
First Grade	0.0	N.S.
Second Grade (nonTitle I)	0.0	N.S.
Second Grade (Title I)	0.2	N.S.
Third Grade	1.2	N.S.

Table 12

Number and Percentage of Students Reported Listening Various Percentages of Times Monitored

Percent of Time Reported Listening*	Encouraged		Minimally Encouraged		Total	
	N	%	N	%	N	%
75-100	23	4.7	20	3.8	43	4.2
50-74	46	9.4	41	7.8	87	8.6
25-49	59	12.1	56	10.6	115	11.3
1-24	16	3.3	29	5.5	45	4.4
0	345	70.6	380	72.2	725	71.4
Total	489	100.0	526	100.0	1015	100.0

$\chi^2 = 6.00$ p = N.S.

*Total number of times reported listening divided by total number of times monitored.

encouraged students (14.1 to 11.6), but there was no overall significant relationship between encouragement and percentage of time reported listening, as shown in Table 12.

Although the two levels of encouragement seemed to have no practical differential effect on dual audio listening, it could be suggested that the reason was the slight difference between the two encouragement levels themselves. The minimally encouraged group, for example, was given much of the same information as the encouraged group. It is possible, therefore, that both types of encouragement may have had about the same effect on listening and that there would, therefore, be little noticeable difference between the two encouragement conditions with respect to listening rates. Another hypothesis for the slight difference is that children of this age have little control over the TV at that time of day and that any encouragement, therefore, would have little effect.

Classification Scheme

The major analysis approach used in the present study was to form meaningful viewing/listening groups and to note the relationships between viewing/listening habits and vocabulary knowledge as measured by pre- and posttests.

A bivariate classification scheme was devised to group students on the basis of the information obtained from the telephone monitoring records. An average viewing and an average listening score was obtained for each pupil who was successfully monitored. Viewing and listening scores were based, therefore, on information obtained from a variable number of monitorings (one to five) for each child.

For each monitoring, a viewing score of three was assigned if the parent (or other person who was reached by telephone) indicated that the subject child was watching The Flintstones when called. If the parent indicated that

the child was not watching but usually did so, a score of one was assigned. A zero score was given if the parent said that the child was not watching and usually did not. The same scheme was used to assign listening scores. The scoring scheme is summarized in Table 13.

Table 13

Viewing (Listening) Scoring Scheme

Status	Viewing(Listening) Score
Viewing(listening) when called	3
Not viewing(listening), usually does	1
Not viewing(listening), usually does not	0

The resultant analysis used these average viewing and listening scores to classify students in a bivariate scheme. Cutting scores on each of the two dimensions were determined from percentages derived from all five monitoring periods. The average (median) percentage of students, across all five monitoring periods, who were viewing when called was the figure that was used to define regular (high) viewers. The average percentage listening when called defined the regular listening group. The corresponding average percentage of students not viewing when called made up the low or nonviewing group and the percentage not listening determined the low listeners. The middle groups were made up of those who were neither high nor low viewers (listeners). Cutting scores were then selected for each dimension so that the appropriate percentages of students fell into each category. The classification scheme

and the percentage of students in each category are presented in Table 14. The range of viewing and listening scores for each category is also indicated.

Table 14

Classification of Students According to Viewing/Listening Habits

Viewing / Listening	Low (0 - .95) N	Low (0 - .95) %	Middle (.96 - 1.75) N	Middle (.96 - 1.75) %	High (1.76 - 3.00) N	High (1.76 - 3.00) %	Total N	Total %
High (1.56 - 3.00)	—		6	0.6	111	11.4	117	12.0
Middle (.76 - 1.55)	3	0.3	102	10.5	81	8.3	186	19.1
Low (0 - .75)	377	38.7	185	19.0	110	11.3	672	68.9
Total	380	39.0	293	30.1	302	31.0	975	100.0

Three of the categories (high listening/low viewing; high listening/mid viewing; and mid listening/low viewing) are irrelevant because of the nature of the relationship of viewing to listening. That is, viewing is an almost necessary condition to make listening to dual audio commentary meaningful.

In general, the procedure classified students in a manner which conformed to the expectations of dual audio staff. About 11% of the sample were classified as regular dual audio users, (high viewers/high listeners) while 39% were considered to be nonusers (low viewers/low listeners). The three irrelevant categories contained a total of less than 1% of the sample.

Children's own reports on the pictorial television viewing record implied that the classification scheme had some validity--at least with respect to viewing classifications. Table 15 provides some evidence to support this contention.

Table 15

Percentage of all Students who Reported on the Television Viewing Record that they Usually Viewed The Flintstones at 4:30

Viewing / Listening	Low		Mid		High	
	Pre	Post	Pre	Post	Pre	Post
High	——		——		39.4 (52.9)	41.4 (56.7)
Mid	——		35.2 (50.6)	40.0 (41.8)	41.0 (47.0)	50.6 (53.0)
Low	33.1 (26.4)*	30.6 (25.5)	37.8 (46.5)	41.3 (50.0)	43.8 (61.0)	46.7 (54.3)

*Numbers in parentheses are percentages of students who indicated they viewed Flintstones at 5:00.

Of those students placed in the low-viewing category by the telephone monitoring scheme, about 32% said they usually viewed The Flintstones at 4:30 p.m. (about 26% at 5:00 p.m.). In contrast to this, on the average about 44% of those classified as high viewers indicated that they usually watched The Flintstones at 4:30 p.m., while about 54% said they usually viewed at 5:00 p.m. It should be noted again, however, that dual audio commentary was heard during only the first of the two half hour episodes.

Total Test Score Results Based on Viewing/Listening Groups

In all analyses using total test scores, the three test forms were treated as equivalent and mean pretest, posttest, and gain scores were computed for each viewing/listening classification for each of the grade level groups. These mean estimates are given in Table 16 for the total student sample. Only students who were monitored at least twice have been included in these analyses.

Table 16

Mean Pretest and Raw Gain Scores by Viewing/Listening Classification (Total Students Monitored Two or More Times)

Viewing / Listening	Low		Mid		High	
	Pre	Gain	Pre	Gain	Pre	Gain
High	—		—		10.8 (N=101)	2.1
Mid	—		9.6 (N=88)	2.1	10.5 (N=79)	2.0
Low	9.7 (N=332)	1.7	9.0 (N=166)	1.9	9.6 (N=100)	2.2

As can be seen from Table 16, the gain score differences among viewing/listening groups were quite small. None was statistically significant. The largest difference was only half a point on the twenty-item test. Furthermore, there seemed to be no consistent positive relationship between listening and gain. In fact, high viewers who were low listeners gained slightly more than high viewers who were also high listeners. Tables 17 - 20, which present the pretest and gain scores for each of the four

samples, show no consistent pattern with respect to a listening effect in any of the samples. Furthermore, none of the gain score differences between low viewers/low listeners and high viewers/high listeners or between high viewers/low listeners and high viewers/high listeners was significant.

Since analysis based on raw gain scores has some well documented statistical disadvantages and since, in this study, listening tended to be correlated with pretest scores (i.e., the more frequent listeners had higher pretest scores), additional analyses were conducted. Namely, a covariance analysis was used to adjust for initial differences among viewing/listening groups with respect to pretest scores.

Table 17

Mean Pretest and Raw Gain Scores by Viewing/Listening Classification (First Grade)

Viewing / Listening	Low		Mid		High	
	Pre	Gain	Pre	Gain	Pre	Gain
High	___		___		9.4 N=27	3.2
Mid	___		8.1 N=17	3.4	9.6 N=9	3.7
Low	8.2 N=88	2.7	7.1 N=27	3.8	8.1 N=30	2.7

Table 18

Mean Pretest and Raw Gain Scores by Viewing/Listening Classification (Second Grade NonTitle I)

Listening \ Viewing	Low		Mid		High	
	Pre	Gain	Pre	Gain	Pre	Gain
High	___		___		13.3 N=30	2.3
Mid	___		12.3 N=15	2.1	13.0 N=27	2.1
Low	12.2 N=88	1.7	11.9 N=37	1.6	13.2 N=23	2.0

Table 19

Mean Pretest and Raw Gain Scores by Viewing/Listening Classification (Second Grade Title I)

Listening \ Viewing	Low		Mid		High	
	Pre	Gain	Pre	Gain	Pre	Gain
High	___		___		9.1 N=26	1.2
Mid	___		8.0 N=30	1.8	7.4 N=24	2.4
Low	7.8 N=88	0.8	8.0 N=68	1.4	7.3 N=20	1.9

Table 20

Mean Pretest and Raw Gain Scores by Viewing/Listening Classification (Third Grade)

Listening \ Viewing	Low		Mid		High	
	Pre	Gain	Pre	Gain	Pre	Gain
High	___		___		11.1 N=18	1.4
Mid	___		10.7 N=26	1.5	11.2 N=19	1.0
Low	10.7 N=68	1.5	9.5 N=34	1.4	9.9 N=27	1.9

Tables 21 - 24 contain for each sample the adjusted posttest means for each viewing/listening category. When these adjustments are made, there appears to be a slight listening gradient in the first grade sample and in the second grade nonTitle I sample. The only statistically significant difference ($p < .01$), however, is the 1.7 difference between high and low listeners in the first grade sample.

Table 21

Adjusted Posttest Means by Viewing/Listening Classification (First Grade)

Viewing / Listening	Low	Mid	High	Total
High	___	___	12.6 N = 27	12.6 N = 27
Mid	___	11.5 N = 17	13.2 N = 9	12.1 N = 26
Low	10.9 N = 88	10.9 N = 27	10.8 N = 30	10.9 N = 145
Total	10.9 N = 88	11.1 N = 44	11.9 N = 66	11.3 N = 198

Table 22

Adjusted Posttest Means by Viewing/Listening Classification (Second Grade NonTitle I)

Viewing / Listening	Low	Mid	High	Total
High	___	___	15.1 N = 30	15.1 N = 30
Mid	___	14.6 N = 15	14.8 N = 27	14.7 N = 42
Low	14.1 N = 89	14.0 N = 37	14.7 N = 23	14.2 N = 149
Total	14.1 N = 89	14.2 N = 52	14.8 N = 80	14.5 N = 221

Table 23

Adjusted Posttest Means by Viewing/Listening Classification (Second Grade Title I)

Listening \ Viewing	Low	Mid	High	Total
High	___	___	9.5 N = 26	9.5 N = 26
Mid	___	9.8 N = 30	10.2 N = 28	10.0 N = 58
Low	8.7 N = 88	9.4 N = 68	9.6 N = 20	9.1 N = 176
Total	8.7 N = 88	9.5 N = 98	9.8 N = 74	9.3 N = 260

Table 24

Adjusted Posttest Means by Viewing/Listening Classification (Third Grade)

Listening \ Viewing	Low	Mid	High	Total
High	___	___	12.0 N = 18	12.0 N = 18
Mid	___	12.0 N = 26	11.6 N = 19	11.8 N = 45
Low	11.9 N = 68	11.6 N = 34	12.2 N = 28	11.9 N = 130
Total	11.9 N = 68	11.8 N = 60	12.0 N = 65	11.9 N = 193

Components of Variance

Regression analyses were computed for each of the grade group samples in order to determine what proportion of the variation in posttest scores could be predicted or accounted for from the reported viewing and listening habits of pupils. The proportions of most interest were those determined after the portion of posttest variance associated with the pretest had been partialled out. That is, how much of the remaining variation in posttest scores (after pretest has been considered) was associated with variation in students' listening and viewing scores? Table 25 below shows the portions of variance accounted for by certain variables.

Table 25

Percentage of Variance Accounted for by Pretest, Viewing, and Listening for Each Grade Level Sample

Sample	Percent of Posttest Variance Accounted for by Pretest	Percent of Residual Posttest Variance (after accounting for that associated with pretest) Accounted for by Viewing and Listening		
		V and L (total)	V uniquely	L uniquely
First Grade	32.5***	2.1	0.0	1.2
Second Grade (nonTitle I)	46.0***	3.2**	1.6*	0.0
Second Grade (Title I)	39.7***	2.3**	1.1**	0.0
Third Grade	46.2***	0.5	0.1	0.4

* p<.10 ** p<.05 *** p<.01

As can be seen from Table 25 above, pretest variation accounted for substantial and significant portions of posttest variance--on the average over 40%. Viewing and listening, however, accounted for considerably smaller amounts of the remaining posttest variation. In only the two second grade samples were these portions significant. The unique contribution of listening (i.e., the contribution beyond that of viewing) however, was negligible and insignificant statistically in each of the four samples.

It should be noted, however, that there was relatively little variation in listening scores. The high proportion of non-users of dual audio instruction resulted in low means and variances for the listening variable. This restricted variation on the listening variable would automatically preclude the detection of very large portions of variance.

Total Test Score Results Based on Total Number of Times Students were Reported Viewing and Listening

A second method of grouping students according to viewing/listening habits was also used. This method also utilized the results from telephone monitorings, but this time the total number of times that a student was reported viewing/listening was used to form groups. In contrast to the method of using average viewing/listening scores, this procedure did not consider the number of times a student was monitored, nor did it use information about students' usual viewing/listening habits. This technique was used since it was felt that the original classification of students into viewing/listening categories, based on average viewing and listening scores, may have misclassified some students. For example, although a student was a relatively frequent user of dual audio instruction, he may not have been a frequent user in the absolute sense. He may, for example, have been classified as a frequent

or moderately frequent user because he was reported to be listening (or usually listening) on, say, only one occasion.

Secondly, it was felt that the use of total times viewing and listening would reduce the possibility that a student would be misclassified because he was monitored infrequently. Of special concern was the isolation of those students who viewed and listened several times. This method, i.e., using scores based on total times that the student was reported viewing and listening, seemed appropriate to ensure that only frequent users were so classified.

Tables 26 - 30 show for each sample and for the total sample the pretest and raw gain scores and standard deviations for students who were reported to be viewing and listening various numbers of times.

Table 31 summarizes the same information for total students when the number of times reported listening regardless of times viewing was considered. From Table 31 it can be seen that the gains made by those who were reported listening four or five times were significantly greater ($p < .05$) than the gain made by those who never listened. The significance test used was the standard one-tailed t test. Use of a more stringent procedure (Dunnett's multiple-range comparison procedure), which is more appropriate for comparing several groups with a control, as we have done, yielded no significant differences.

By examining each of the Tables 26 - 30, one can see that the largest gains in the total sample are due mainly to those made by a few first graders. Furthermore, these large gains were made by students who had very low pretest scores. The scores of these students were so low initially, that the gains made by them are somewhat suspect, since they could be considered to have resulted from simple regression toward the mean. It seems, then, that the

"nearly significant" results reported above should not be viewed too optimistically.

Further regression analyses performed to determine how much of the residual posttest variance could be accounted for by the variables "total times reported viewing" and "total times reported listening" (Table 32) gave essentially the same results as those using average viewing and listening scores. In none of the samples did listening account for a significant portion of residual posttest variance.

Table 26

Pretest and Gain Scores by Number of Times Viewing and Listening for Total Sample
(Standard Deviations in Parentheses)

Times Reported Listening \ Times Reported Viewing	None		One		Two		Three		Four		Five		Total	
	Pre	Gain	Pre	Gain	Pre	Gain	Pre	Gain	Pre	Gain	Pre	Gain	Pre	Gain
Five	—		—		—		—		—		5.8 (3.6) N=4	5.3 (4.3)	5.8 (3.6) N=4	5.3 (4.3)
Four	—		—		—		—		9.8 (4.0) N=8	2.3 (3.0)	10.0 (4.4)	5.4 (1.2)	9.8 (4.1) N=13	3.5 (3.6)
Three	—		—		—		11.3 (3.6) N=10	2.7 (3.2)	11.1 (3.2) N=9	0.6 (3.6)	9.0 (0.0) N=1	-1.0 (0.0)	11.1 (3.3) N=20	1.6 (3.5)
Two	—		—		10.3 (3.7) N=43	2.2 (3.3)	12.2 (3.9) N=23	2.1 (2.7)	13.0 (4.4) N=8	-0.1 (.19)	10.3 (4.7) N=4	1.0 (4.9)	11.1 (4.1) N=78	1.9 (3.2)
One	—		9.8 (3.6) N=84	2.1 (2.4)	10.0 (3.7) N=64	1.9 (2.6)	9.9 (3.8) N=19	2.3 (2.6)	11.6 (3.2) N=10	2.1 (1.6)	9.0 (0.0) N=1	-.40 (0.0)	10.0 (3.7) N=178	2.0 (2.5)
None	9.6 (3.9) N=436	1.5 (3.0)	9.2 (3.7) N=169	1.8 (3.1)	9.2 (3.7) N=80	2.0 (3.4)	9.8 (3.6) N=27	3.3 (3.0)	9.5 (3.7) N=10	2.4 (2.1)	—		9.5 (3.8) N=722	1.7 (3.0)
Total	9.6 (3.9) N=436	1.5 (3.0)	9.4 (3.7) N=253	1.9 (2.8)	9.7 (3.7) N=187	2.0 (3.1)	10.7 (3.9) N=79	2.6 (2.9)	11.0 (3.9) N=45	1.5 (2.7)	8.8 (4.4) N=15	3.1 (4.9)	9.7 (3.8) N=1015	1.8 (3.0)

Table 27

Pretest and Gain Scores by Number of Times Viewing and Listening for First Grade Sample
(Standard Deviations in Parentheses)

Times Reported Listening \ Times Reported Viewing	None		One		Two		Three		Four		Five		Total	
	Pre	Gain	Pre	Gain	Pre	Gain	Pre	Gain	Pre	Gain	Pre	Gain	Pre	Gain
Five	—		—		—		—		—		3.7 (0.5)	7.7 (0.9) N=3	3.7 (0.5)	7.7 (0.9) N=3
Four	—		—		—		—		8.7 (3.9)	3.3 (3.3) N=3	6.5 (1.5)	8.5 (0.5) N=2	7.8 (3.3)	5.4 (3.6) N=5
Three	—		—		—		5.5 (1.5)	3.0 (2.0) N=2	10.5 (2.5)	-0.5 (6.5) N=2	9.0 (0.0)	-1.0 (0.0) N=1	8.2 (2.9)	0.8 (4.7) N=5
Two	—		—		11.0 (4.0)	2.7 (2.4) N=7	10.3 (4.0)	5.3 (2.4) N=3	14.5 (0.5)	0.0 (0.0) N=2	11.0 (0.0)	-3.0 (0.0) N=1	11.4 (3.8)	2.5 (3.1) N=13
One	—		8.1 (2.9)	3.3 (2.4) N=20	7.7 (3.2)	2.0 (2.9) N=6	8.0 (1.7)	5.0 (2.5) N=5	10.0 (2.9)	2.3 (1.2) N=3	9.0 (0.0)	-4.0 (0.0) N=1	8.2 (2.9)	3.0 (2.8) N=35
None	8.3 (3.5)	2.7 (3.2) N=101	7.4 (3.0)	3.3 (3.0) N=33	8.1 (3.6)	3.6 (2.9) N=16	7.2 (2.1)	3.5 (2.4) N=6	9.0 (0.8)	2.7 (2.5) N=3	—		8.1 (3.3)	2.9 (3.1) N=159
Total	8.3 (3.5)	2.7 (3.2) N=101	7.6 (3.0)	3.3 (2.8) N=53	8.7 (3.8)	3.0 (2.9) N=29	7.8 (2.8)	4.3 (2.5) N=16	10.2 (3.2)	1.8 (3.6) N=13	6.6 (2.8)	4.0 (5.3) N=8	8.2 (3.4)	3.0 (3.1) N=220

Table 28

Pretest and Gain Scores by Number of Times Viewing and Listening for Second Grade NonTitle I Sample
(Standard Deviations in Parentheses)

Times Reported Listening \ Times Reported Viewing	None		One		Two		Three		Four		Five		Total	
	Pre	Gain	Pre	Gain	Pre	Gain	Pre	Gain	Pre	Gain	Pre	Gain	Pre	Gain
Five	—		—		—		—		—		—		—	
Four	—		—		—		—		13.0 (2.0) N=2	-1.5 (0.5)	10.0 (3.0) N=2	5.5 (1.5)	11.5 (3.0) N=4	2.0 (3.7)
Three	—		—		—		13.0 (2.4) N=6	2.0 (3.7)	13.0 (0.0) N=1	3.0 (0.0)	—		13.0 (2.3) N=7	2.1 (3.4)
Two	—		—		12.1 (2.9) N=12	3.2 (2.0)	14.7 (2.9) N=10	1.9 (2.1)	14.3 (1.7) N=3	0.7 (2.5)	—		13.4 (3.1) N=25	2.4 (2.3)
One	—		12.7 (2.5) N=19	2.3 (1.6)	11.8 (2.4) N=20	2.2 (1.9)	14.3 (1.7) N=6	2.0 (1.2)	13.7 (1.9) N=3	1.3 (1.7)	—		12.6 (2.5) N=48	2.1 (1.7)
None	12.8 (3.3) N=105	1.1 (2.5)	11.5 (3.0) N=37	2.3 (2.7)	12.6 (3.6) N=14	1.4 (1.8)	13.3 (2.9) N=7	3.3 (2.4)	12.0 (4.0) N=2	2.5 (1.5)	—		12.5 (3.3) N=165	1.5 (2.6)
Total	12.8 (3.3) N=105	1.1 (2.5)	11.9 (2.9) N=56	2.3 (2.4)	12.1 (3.0) N=46	2.2 (2.0)	13.9 (2.7) N=29	2.3 (2.5)	13.4 (2.5) N=11	1.0 (2.2)	10.0 (3.0) N=2	5.5 (1.5)	12.6 (3.2) N=249	1.8 (2.5)

Table 29

Pretest and Gain Scores by Number of Times Viewing and Listening for Second Grade Title I Sample
(Standard Deviations in Parentheses)

Times Reported Listening \ Times Reported Viewing	None		One		Two		Three		Four		Five		Total	
	Pre	Gain	Pre	Gain	Pre	Gain	Pre	Gain	Pre	Gain	Pre	Gain	Pre	Gain
Five	—		—		—		—		—		12.0 (0.0) N=1	-2.0 (0.0)	12.0 (0.0) N=1	-2.0 (0.0)
Four	—		—		—		—		5.0 (0.0) N=1	5.0 (0.0)	17.0 (0.0) N=1	-1.0 (0.0)	11.0 (6.0) N=2	2.0 (3.0)
Three	—		—		—		11.0 (0.0) N=1	6.0 (0.0)	10.0 (3.9) N=4	0.5 (2.1)	—		10.2 (3.5) N=5	1.6 (2.9)
Two	—		—		8.9 (3.7) N=15	1.2 (4.4)	9.1 (2.8) N=7	1.7 (2.9)	2.0 (0.0) N=1	0.0 (0.0)	7.0 (4.0) N=2	3.0 (6.0)	8.6 (3.7) N=25	1.4 (4.1)
One	—		7.9 (3.3) N=19	1.6 (2.5)	7.5 (3.6) N=17	2.6 (2.9)	7.5 (3.5) N=6	0.8 (1.9)	—		—		7.7 (3.4) N=42	1.9 (2.7)
None	7.3 (3.2) N=121	1.1 (3.1)	7.9 (3.3) N=56	1.1 (3.4)	7.9 (3.4) N=28	2.3 (3.2)	8.7 (3.0) N=6	2.7 (3.8)	8.3 (5.4) N=3	2.7 (1.2)	—		7.6 (3.2) N=214	1.2 (3.1)
Total	7.3 (3.2) N=121	1.1 (3.1)	7.9 (3.3) N=75	1.2 (3.2)	8.0 (3.6) N=60	2.1 (3.5)	8.6 (3.1) N=20	2.0 (3.1)	8.0 (4.9) N=9	1.7 (2.2)	10.8 (5.0) N=4	0.8 (4.8)	7.8 (3.3) N=287	1.4 (3.2)

Table 30

Pretest and Gain Scores by Number of Times Viewing and Listening for Third Grade Sample
(Standard Deviations in Parentheses)

Times Reported Listening / Times Reported Viewing	None		One		Two		Three		Four		Five		Total	
	Pre	Gain	Pre	Gain	Pre	Gain	Pre	Gain	Pre	Gain	Pre	Gain	Pre	Gain
Five	—		—		—		—		—		—		—	
Four	—		—		—		—		10.5 (3.5) N=2	3.0 (0.0)	—		10.5 (3.5) N=2	3.0 (0.0)
Three	—		—		—		13.0 (0.0) N=1	3.0 (0.0)	13.0 (0.0) N=2	0.5 (1.5)	—		13.0 (0.0) N=3	1.3 (1.7)
Two	—		—		9.4 (3.6) N=9	2.3 (2.5)	13.0 (2.2) N=3	0.7 (1.2)	15.0 (2.0) N=2	-1.5 (1.5)	16.0 (0.0) N=1	1.0 (0.0)	11.3 (3.9) N=15	1.4 (2.5)
One	—		10.5 (3.6) N=26	1.6 (2.4)	11.0 (3.4) N=21	1.1 (2.5)	8.5 (0.5) N=2	0.5 (2.5)	11.3 (3.4) N=4	2.5 (1.5)	—		10.6 (3.4) N=53	1.4 (2.4)
None	10.3 (3.5) N=115	1.3 (2.8)	10.2 (3.7) N=43	1.2 (2.4)	9.5 (2.7) N=22	1.0 (4.1)	9.6 (3.1) N=8	3.6 (3.1)	9.5 (0.5) N=2	1.5 (2.5)	—		10.1 (3.4) N=187	1.4 (2.9)
Total	10.3 (3.5) N=115	1.3 (2.8)	10.3 (3.6) N=69	1.4 (2.4)	10.1 (3.2) N=52	1.3 (3.3)	10.4 (3.1) N=14	2.5 (3.0)	11.8 (3.1) N=12	1.4 (2.2)	16.0 (0.0) N=1	1.0 (0.0)	10.3 (3.5) N=259	1.4 (2.8)

Table 31

Pretest and Gain Scores by Number of Times Reported Listening (Total Sample)

Times Reported Listening	N	Pretest Mean	Pretest S.D.	Gain Mean	Gain S.D.	Significance of Gain[1]
None	722	9.5	(3.8)	1.7	(3.0)	____
One	178	10.0	(3.7)	2.0	(2.5)	N.S.
Two	78	11.1	(4.1)	1.9	(3.2)	N.S.
Three	20	11.1	(3.3)	1.6	(3.5)	N.S.
Four	13	9.8	(4.1)	3.5	(3.6)	$p < .05$
Five	4	5.8	(3.6)	5.3	(4.3)	$p < .05$

[1]Based on one-tailed t tests of the difference between the mean gain score for those reported listening no times and each of the other groups

Table 32

Percentage of Variance Accounted for by Pretest, Total Viewing, and Total Listening for Each Grade Level Sample

Sample	Percentage of Residual Posttest Variance (after accounting for that associated with pretest) Accounted for by Total Viewing and Total Listening		
	V and L (total)	V uniquely	L uniquely
First Grade	1.2	0.0	0.8
Second Grade (nonTitle I)	3.0**	1.5*	0.0
Second Grade (Title I)	2.1	1.7*	0.1
Third Grade	0.4	0.0	0.0

*$p < .10$ **$p < .05$

Relationships Among Viewing and Listening Measures

As stated above, several distinct methods were used to assess the extent to which children viewed and listened. The major method was the telephone

monitoring system from which two classification schemes were devised—one using total times reported viewing and total times reported listening and the other using average viewing and average listening scores.

A secondary method was the use of brief program-specific viewing/listening tests. These tests have been described above. The correlations among these measures or methods are presented in Table 33.

Table 33

Correlations among Viewing and Listening Measures (Total Sample)

	Measure					
Measure	1	2	3	4	5	6
1) Viewing Test	1.00	___	___	___	___	___
2) Avg. Viewing	.27	1.00	___	___	___	___
3) Total Viewing	.21	.84	1.00	___	___	___
4) Listening Test	.22	.14	.14	1.00	___	___
5) Avg. Listening	.20	.66	.59	.20	1.00	___
6) Total Listening	.17	.58	.72	.18	.86	1.00

In general the correlations among the viewing scores are low, except for the correlation of scores derived from telephone monitorings. The same is true for listening scores.

In addition, measures of the same variable (e.g., viewing) by different methods (i.e., telephone monitoring and viewing tests) were, in general, no more highly correlated than were measures of different variables (viewing and listening) using the same method. This finding is probably not surprising,

since the viewing and listening tests were extremely brief and were administered only once or twice to each student.

Analyses Based on Viewing/Listening Test Scores

In view of the lack of correlation between the telephone monitoring scores and the viewing/listening test scores, regression analyses were conducted using viewing and listening test scores as independent variables. Listening, however, as measured by the listening test, accounted for nonsignificant portions of residual posttest variance (less than 1%) in each of the four samples.

Students Reported Listening During the Fifth Monitoring Period

An additional post hoc analysis was conducted to determine whether those students who had been listening during the last monitoring period had benefited more than other groups. It was postulated that these students might have benefited more from dual audio instruction, since they were still reported to have been listening near the end of the broadcast period. However, the scores of 39 students who were monitored five times and who were reported listening on the fifth monitoring, do not support the hypothesis. Students in this group progressed 2.3 points from a pretest mean of 9.9. This gain, however, was not statistically different from those calculated for other viewing/listening categories in the total student sample.

Item Analyses

Percentages of students who correctly answered each item were calculated for each viewing/listening group for each of the three test forms. Comparisons of pretest and gain percentages for regular dual audio users (high viewers/high listeners) and nonusers (low viewers/low listeners) appear in Tables 34 - 36 for each test form.

Table 34

Percentage of Selected Students Correctly Answering Each Item on Pretest and Gain in Percentage from Pretest to Posttest (Form A)

Item	Nonusers (N=83)		Regular users (N=28)	
	Pre	Gain	Pre	Gain
Challenge	54%	17%	75%	-1%
Genius	48	8	68	6
Wealthy	13	0	21	8
Advice	30	13	39	16
Ancestor	39	-5	32	16
Indent	16	16	25	40
Resist	28	0	32	10
Considerate	45	-3	43	15
Rhythm	36	20	64	7
Contest[1]	69	18	71	22
Investigate	52	22	68	13
Appreciate	61	10	57	30
Career	40	3	25	33
Native	37	-5	32	10
Beware	60	15	71	12
Discover*	64	5	71	19
Illusion	25	8	29	23
Confidence	31	12	54	14
Actor	52	20	64	20
Exercise*	57	14	64	3

*Word appearing in Flintstones scripts but not taught by dual audio radio.

[1]Word reinforced or repeated during subsequent Flintstones episodes.

Table 35

Percentage of Selected Students Correctly Answering Each Item on Pretest and Gain in Percentage from Pretest to Posttest (Form B)

Item	Nonusers (N=121)		Regular users (N=41)	
	Pre	Gain	Pre	Gain
Honor	64%	7%	68%	12%
Invite	69	14	73	7
Boring	35	9	41	7
Invent	41	17	49	10
Warehouse*	45	20	49	14
Anchor*	50	15	66	5
Conceal	16	2	15	2
Advantage	24	-7	24	-12
Talent[1]	44	11	49	15
Rescue	74	13	85	13
Habit	49	14	46	22
Entertain	56	10	73	2
Normal	65	14	61	22
Tourist	45	9	61	10
Solo[1]	19	10	15	7
Fortune[1]	72	1	68	20
Committee	46	13	54	12
Automatic	44	25	44	24
Rehearse	26	13	37	10
Imagine	54	12	63	10

*Word appearing in Flintstones scripts but not taught by dual audio radio.

[1]Word reinforced or repeated during subsequent Flintstones episodes.

Table 36

Percentage of Students Correctly Answering Each Item on Pretest and Gain in Percentage from Pretest to Posttest (Form C)

Item	Nonusers (N=144) Pre	Nonusers (N=144) Gain	Regular users (N=32) Pre	Regular users (N=32) Gain
Law	71%	14%	83%	5%
Celebrate[1]	82	10	89	8
Defend	66	8	83	5
Hobby	2	3	9	1
Complain[1]	73	7	80	-2
Athlete	40	9	63	0
Influence	42	-3	34	13
Deny	15	7	17	2
Coward[1]	54	7	69	13
Property	75	0	80	8
Skillful	56	1	49	17
Intercept	23	4	20	5
Charity	52	3	60	-7
Nerve	48	13	63	3
Failure*	65	15	74	10
Fund	54	-6	49	11
Appearance	17	6	37	-3
Repair*	83	-2	86	-4
Rodeo	62	-3	71	-9
Champion	70	7	83	2

*Word appearing in Flintstones scripts but not taught by dual audio radio.

[1]Word reinforced or repeated during subsequent Flintstones episodes.

On 32 of the sixty items in the three test forms, the students classified as non-users showed greater percentage gains from pretest to posttest than students classified as regular users. On 25 items the regular users exhibited greater gains, and on 3 there were no differences. These item percentages suggest, therefore, that the use of dual audio instruction did not result in any systematic improvement with respect to the words emphasized in dual audio instruction. Additional comparisons of item percentages for words taught and those not taught, for repeated and nonrepeated words, and for words taught early or late in the six-month period showed nothing to suggest any effect of listening to dual audio radio.

SUMMARY, CONCLUSIONS, AND SUGGESTIONS FOR FURTHER RESEARCH

Summary and Conclusions

This study used two design features to test the effectiveness of a six-month public broadcast of dual audio instruction. The first feature was the encouragement experiment, in which half of more than sixty classes of first, second, and third grade students in two of the eight districts in the Philadelphia school system were encouraged to listen to dual audio radio in their homes. Students in the remaining classes were given only minimal encouragement. Results of the encouragement experiment showed that the different encouragement conditions resulted in only a very slight difference in the rate at which children listened to dual audio radio and no difference in improvement on the vocabulary taught by the method.

It is possible, however, that encouragement may have affected the utilization rate of both the encouraged and the minimally encouraged groups. That is, the difference in the amount of effective encouragement received by each group may have been so slight that no differential effects were detected. If telephone monitoring reports accurately reflected students' viewing/listening habits, then the relatively high rate of dual audio listening reported for students in the sample (about 40% of those viewing The Flintstones were reported to have been listening to dual audio radio), when compared to the rate in the general population,* suggested that encouragement was somewhat effective for both groups.

Unfortunately, however, the encouragement feature of the design depended on encouragement's producing a more substantial difference in the viewing/

---

*Estimates based on previous research and on a coincidental survey suggest a much lower rate of student utilization of dual audio instruction. It is possible that the monitoring itself may have boosted the dual audio listening rate.

listening habits of students assigned to the different encouragement levels.

The second design feature used various viewing and listening measures, primarily a telephone monitoring system, to categorize students according to their viewing/listening habits during the six-month broadcast. Two slightly different scoring methods were used in conjunction with the telephone monitoring records. Neither method, however, showed any large effect of dual audio listening, although there were some positive notes, especially in the first grade sample.

The evaluation conducted was principally concerned with two distinct questions about the impact of dual audio instruction. The first question can be phrased as follows:

> What is the impact of dual audio instruction on a population of students who are given information about its availability or are encouraged to use it?

The second question regarding impact was:

> What is the impact of dual audio instruction on those students who regularly listen to dual audio radio?

The answer to the first question, as provided by the present evaluation, was not very encouraging. Listening to dual audio radio did not account for a significant portion of the variation in students' vocabulary improvement in the total student sample or in any of the subsamples. The lack of impact on the total sample could be attributed to the lack of student use of dual audio instruction. Only 12% of the students in the sample were classified as regular listeners and, of these regular listeners, the data

suggested that many probably listened only about half the time. Since there were, therefore, so few regular dual audio fans, the total impact of dual audio instruction on the vocabulary development of the larger population was, needless to say, extremely small.

The answer to the second question concerning the impact of dual audio instruction was slightly more positive than the first answer. There was some indication that students who were regular listeners did improve somewhat more with respect to knowing the words taught by dual audio television than did nonlisteners. This positive finding, however, is the almost exclusive result of large gains made by an extremely small number of regular listeners in the first grade sample. This finding should be accepted with extreme caution and subjected to replication.

In short, the answers to the questions regarding the impact of dual audio instruction suggest that even if dual audio instruction does benefit some regular users, its value is still somewhat questionable unless more students can be encouraged to use it.

Limitations of the Study

One of the most troublesome problems associated with the evaluation reported herein was the measurement of utilization of dual audio instruction. Although the nature of many educational interventions allows an evaluator to obtain some objective measure (e.g., classroom attendance) of a student's, exposure to a particular educational treatment, the nature of dual audio instruction did not offer this luxury. The primary means of determining student use of dual audio instruction was a telephone monitoring system. Since a particular student could be monitored no more frequently than once a month in the

present study, the estimates of student utilization were based on a small sample of student behavior. Thus, the error that can be attributed to the sampling of occasions may have been substantial. Furthermore, the problem of different numbers of completed monitorings for various students may have introduced some bias in estimates. There is some reason to assume, for instance, that missing observations are not missing at random. For example, it is possible that a student may not have been monitored on a particular occasion because he was not at home and, therefore, probably not listening to dual audio radio. The classification scheme using "total times listening" was thought to have reduced this bias, but in doing so another type of bias may have been introduced.

A second problem in the present study was the extent to which students used dual audio instruction. As expected, only about 12% of students in the sample were classified as high viewing/high listening under the first classification scheme. We have referred to the students who were classified in this way as "regular" users of dual audio instruction. The fact is, however, that it may not have been appropriate to refer to even these relatively frequent users as regular ones. It is quite likely, for example, that the typical "regular" user might have been one who listened to dual audio instruction only once or twice a week or who listened very frequently during the early months of the broadcast and then completely stopped listening. We have determined in the analyses presented above that, on the average, about 12% of the students monitored were reported to be listening to dual audio instruction on any particular occasion. The use of this percentage in the classification of students into viewing/listening groups was based on the implicit assumption that it was the same 12% that were watching every, or

nearly every, day. The fact is, however, that it may have been a different 12% on each day. That is, from what is known about the TV viewing habits of children, it is more likely that a large percentage of students viewed (listened), say, once or twice a week than that a small percentage viewed (listened) every day. Telephone monitoring data seemed to confirm the latter situation.

The point of the argument presented above is that there may not have very much difference in the actual amount of viewing/listening between those students termed regular users and those called non-users. The additional analyses that were undertaken tried to compensate for that deficiency by using "total times reported listening" to classify students. Although this latter technique may have been helpful in identifying the "true" regular users, it was still not sufficient.

A further problem was the relationship of the technique used to assess vocabulary improvement to the nature of the dual audio treatment. The dual audio curriculum consisted of approximately 240 vocabulary words. In general, two words were introduced each day during the six-month broadcast. Unlike a TV show like Sesame Street, dual audio words were not repeated in subsequent episodes with any regularity. Thus, given the relative infrequency with which a student--even a "regular" user--could be expected to listen to dual audio instruction, the probability that a student would be introduced to a particular word was fairly small. Furthermore, the fact that, because of time constraints, each student could be tested on only 20 of the 240 or so words. This resulted in a very low probability that a student would be introduced to a word by dual audio instruction and also tested on that word. The chances were not great, therefore, that his score on the twenty-item vocabulary test would improve as a result of dual audio

instruction, even if the instruction were totally effective in teaching each word. The chances of improvement were further reduced because children already knew many of the dual audio words.

As a simplified example, suppose the following model were appropriate for predicting improvement on the vocabulary tests used in the present study. Assume that a student who was classified as a "regular" user listened to dual audio instruction on an average of twice a week over the six-month broadcast period. The probability that he was exposed to the two words introduced on a given day are, therefore, 2 in 5. Over the six-month period a "regular" listener would, therefore, be exposed to slightly fewer than 100 of the 240 dual audio words. Pretest data showed that an average student could correctly answer nearly half of the words that were tested. Since each student was tested on only 20 of the 240 dual audio words, the chances that he was tested on a word to which he was exposed were only 1 in 12. If we assume that the dual audio treatment was 100% effective, i.e., a student exposed to a word learned that word, then the chances of improving on any given test item are calculated as follows:

$$P_I = P_T \times P_U \times P_{ex} \times P_{eff}$$

where

P_I = the probability of improvement on an item due to dual audio instruction.

P_T = the probability of being tested on the item.

P_U = the probability that the word was previously unknown.

P_{ex} = the probability of exposure to the word by dual audio instruction.

P_{eff} = the probability that dual audio instruction is effective in teaching the word.

In the case where dual audio instruction is 100% effective

$$P_I = \frac{1}{12} \times \frac{1}{2} \times \frac{2}{5} \times \frac{1}{1} = \frac{1}{60}$$

If a more reasonable effectiveness quotient is assumed, say $P_{eff} = .75$, then P_I becomes $\frac{1}{80}$. Thus on a 20-item test the expected gain for a 100% effective treatment would be $20 \times \frac{1}{60}$ or only .33; for a 75% effective treatment, only .25. Such small differences are difficult to detect in the face of all the other factors that may affect test scores.

Admittedly, the model presented above is an oversimplification, but it does serve to point out the nature of the problem when one attempts to determine the effects of dual audio instruction as it existed in the present study.

Suggestions for Future Research

In light of what was learned during the research effort conducted this year, there may be needed techniques that more directly relate the dual audio treatment to the criterion. That is, instead of the relatively gross variables that were used in the past year's evaluative research (such as average and total times reported listening), finer variables may be needed. Ideally, one would like to determine which children were watching on which days and then calculate the improvement in knowledge of the words taught each day.

A research design is currently under consideration to address the question of dual audio effectiveness by using these finer variables. This design would use a scheme in which only a fraction of the participating students would be monitored during any particular period of the broadcast period. That is, a small group of students would be monitored for a short period of time (possibly even just one show) and tested on the words introduced during the episode or episodes. As a consequence, the effects of listening to dual audio instruction could be assessed in a manner not possible when the previous designs were used. Any new design should probably also include some features of previous designs so that retention, as well as short term recall, can be determined.

Any new design should probably also contain new variations in the dual audio treatment itself. Especially important would be the frequency with which dual audio words are repeated in the dual audio commentary. It may be unreasonable to expect any educational technique that relies so heavily on single exposures to have much, if any, effect in an area like vocabulary development. It is possible that certain very bright children might benefit from this type of instruction, but the literature on learning theory suggests that the technique might need modification before it can be successful with larger numbers of children.

The single-exposure instructional technique used in the current dual audio instruction raises questions about the amount of retention that can be reasonably expected at the end of the broadcast period. That is, since the criterion measure used in the present study is essentially one requiring fairly long-term retention, any learning that did take place because of dual audio instruction might have faded by the time students were given the opportunity to demonstrate what they had learned.

In conclusion, it appears that different evaluation techniques and/or instructional techniques may be needed to demonstrate the success of dual audio television. Refinements in the methods used to evaluate dual audio television instruction, as it now exists, may show more positive results. Further fine-tuning of evaluation/measurement techniques may, however, pick up an effect that has little practical significance or policy relevance. How valuable, for example, is a treatment from which a child may remember a word for only several hours? Although appropriate techniques may make it possible to detect such an effect, it is doubtful that such an effect should be regarded as very important. In short, it seems that in further efforts both the treatment and the evaluation may need some modification.

References

Ball, S., and Bogatz, G. The first year of Sesame Street: An evaluation. Princeton, N.J.: Educational Testing Service, PR 70-15, October, 1970.

Ball, S., and Bogatz, G. Reading with television: An evaluation of The Electric Company. Princeton, N.J.: Educational Testing Service, PR 72-2, February, 1973.

Borton, T., Belasco, L., and Baskerville, S. "Broadcasting dual audio television instruction." In P.L. Klinge (Ed.), American education in the electric age. Englewood Cliffs, N.J.: Educational Technology Publications, Inc., 1974.

Lyle, J., and Hoffman, H. "Children's use of television and other media." In E. Rubenstein et al. (Eds.), Television and social behavior. Vol. IV. Washington, D.C.: U.S. Government Printing Office, 1972.

Appendix A

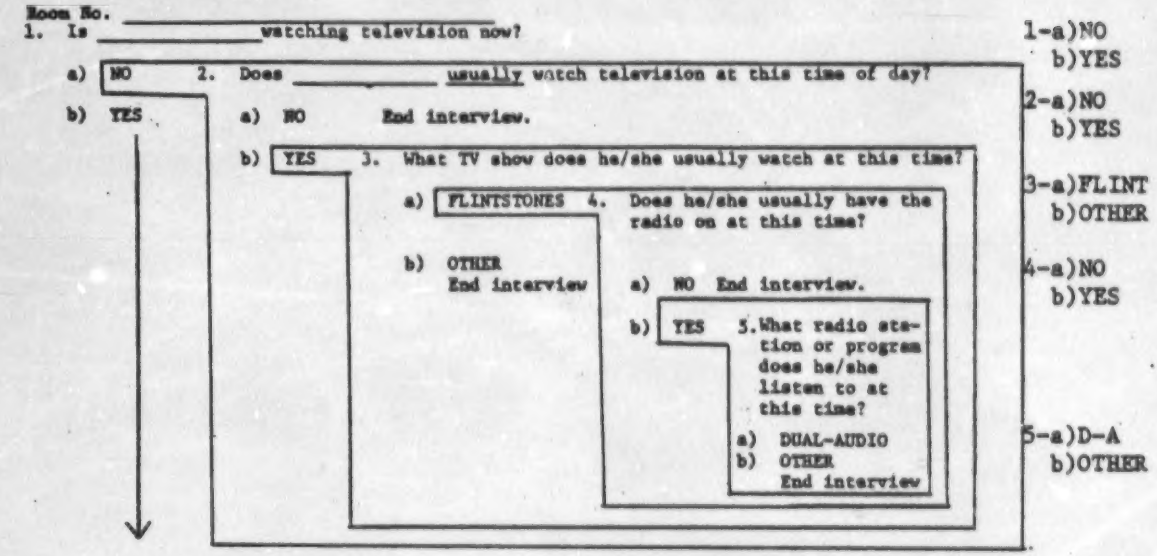
Dual Audio Telephone Monitoring Form

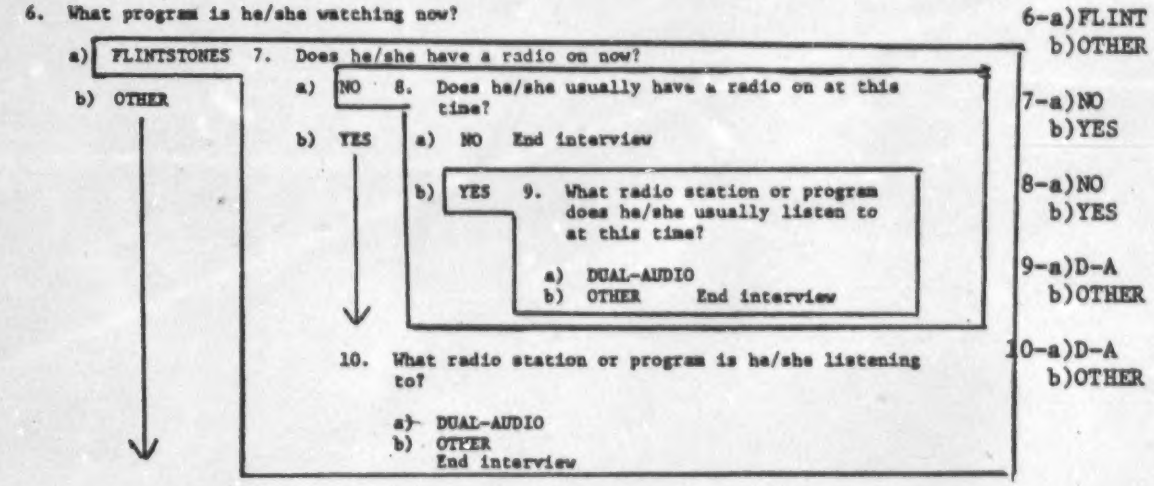
Child's Name _____ Observation No. _____

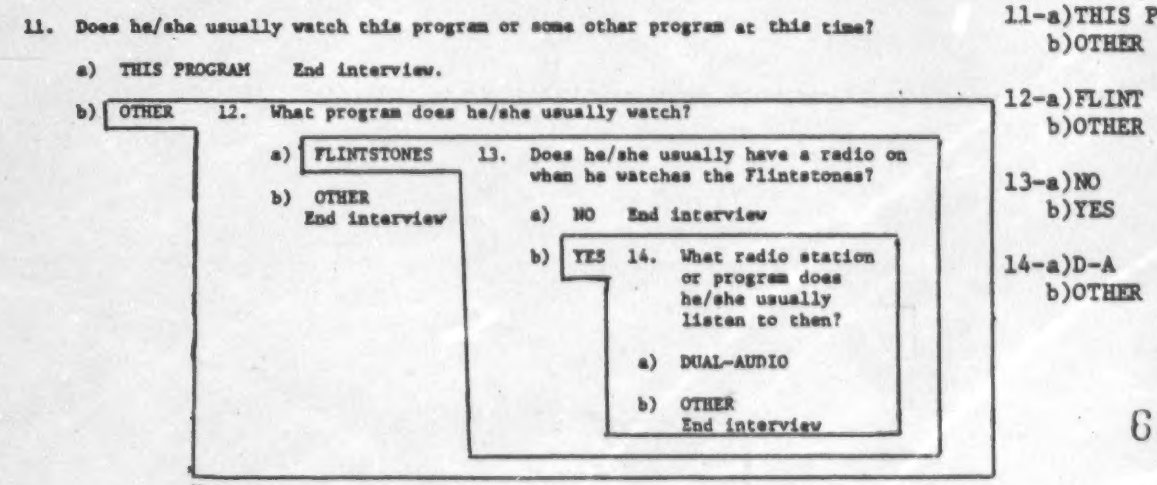
Identification No. _____ Status _____

School _____ Monitor's Initials ____

Room No. _____


1. Is _____ watching television now?
a) NO
b) YES
2. Does _____ usually watch television at this time of day?
a) NO End interview.
b) YES
3. What TV show does he/she usually watch at this time?
a) FLINTSTONES
4. Does he/she usually have the radio on at this time?
b) OTHER End interview
a) NO End interview.
b) YES
5. What radio station or program does he/she listen to at this time?
a) DUAL-AUDIO
b) OTHER End interview
1-a) NO b) YES
2-a) NO b) YES
3-a) FLINT b) OTHER
4-a) NO b) YES
5-a) D-A b) OTHER


6. What program is he/she watching now?
a) FLINTSTONES
7. Does he/she have a radio on now?
b) OTHER
a) NO
8. Does he/she usually have a radio on at this time?
b) YES
a) NO End interview
b) YES
9. What radio station or program does he/she usually listen to at this time?
a) DUAL-AUDIO
b) OTHER End interview
10. What radio station or program is he/she listening to?
a) DUAL-AUDIO
b) OTHER End interview
6-a) FLINT b) OTHER
7-a) NO b) YES
8-a) NO b) YES
9-a) D-A b) OTHER
10-a) D-A b) OTHER


11. Does he/she usually watch this program or some other program at this time?
a) THIS PROGRAM End interview.
b) OTHER
12. What program does he/she usually watch?
a) FLINTSTONES
13. Does he/she usually have a radio on when he watches the Flintstones?
b) OTHER End interview
a) NO End interview
b) YES
14. What radio station or program does he/she usually listen to then?
a) DUAL-AUDIO
b) OTHER End interview
11-a) THIS PROGRAM b) OTHER
12-a) FLINT b) OTHER
13-a) NO b) YES
14-a) D-A b) OTHER

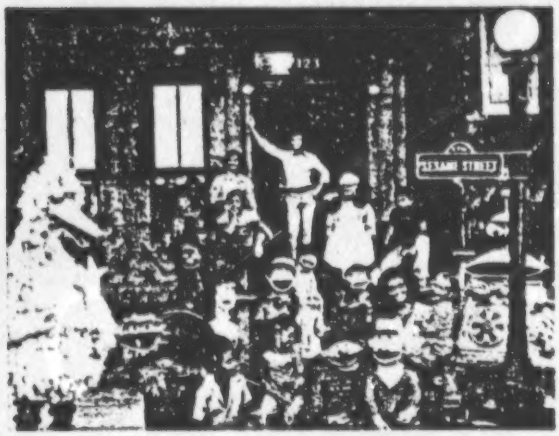
Write any comments made by parents on back.

Appendix B

Your name _____ Teacher _____

School _____

1. SESAME STREET



2. MIKE DOUGLAS SHOW

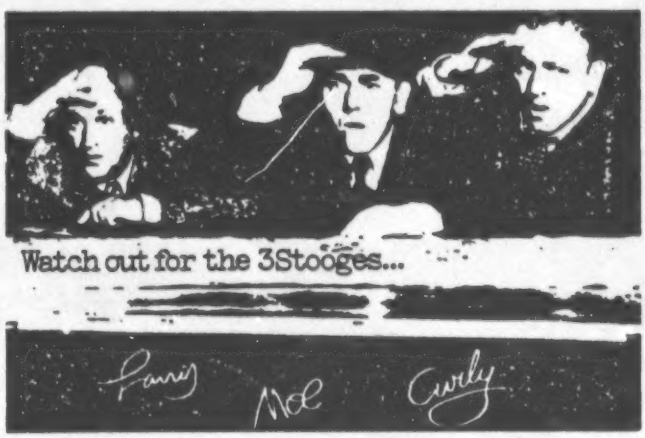
3. THE FLINTSTONES

4. DINAH!

5. MOD SQUAD

MOD
SQUAD

6. THE THREE STOOGES



4:30 P.M.

1. DINAH!

2. MISTER ROGERS' NEIGHBORHOOD

3. THE FLINTSTONES

4. BEWITCHED

5. MIKE DOUGLAS SHOW

6. RAYMOND BURR SHOW (IRONSIDE)

5:00 P.M.

Appendix C

NAME _____ DATV LISTENING TEST #46

SCHOOL _____ ROOM _____

1. WHAT PROGRAM IS ON CHANNEL 48 AT 4:30, MONDAY-FRIDAY?

   A. THE FLINTSTONES
   B. HOWDY DOODY
   C. THE WALTONS

2. WHY WAS FRED SO TIRED ON YESTERDAY'S FLINTSTONES PROGRAM?

   A. BECAUSE DINO KEPT WAKING HIM UP
   B. BECAUSE HE HAD TO SLEEP ON THE ROCKING CHAIR
   C. BECAUSE HE WAS WORKING LATE EVERY NIGHT
   D. I DIDN'T WATCH THE PROGRAM

3. WHERE DID FRED HIDE ON YESTERDAY'S FLINTSTONES PROGRAM?

   A. BEHIND THE DOOR
   B. UNDER THE TABLE
   C. IN THE CLOSET
   D. I DIDN'T WATCH THE PROGRAM

4. WHY DID WILMA SERVE FRED BREAKFAST IN BED ON YESTERDAY'S FLINTSTONES PROGRAM?

   A. BECAUSE HE WAS SICK
   B. TO SHOW HOW MUCH SHE LOVED HIM
   C. BECAUSE HIS LEG WAS BROKEN
   D. I DIDN'T WATCH THE SHOW

5. WHICH OF THESE WORDS DID STEVE TALK ABOUT YESTERDAY DURING THE FLINTSTONES?

   A. CONTENTED
   B. APPRECIATE
   C. LEGEND
   D. I DIDN'T HEAR THE PROGRAM

6. WHICH OF THESE WORDS DID STEVE TALK ABOUT YESTERDAY DURING THE FLINTSTONES?

   A. AMBITION
   B. GUARDIAN
   C. CRIMSON
   D. I DIDN'T HEAR THE PROGRAM